

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-10 (canceled):

Claim 11 (previously presented): A valve gear comprising:
a camshaft having a first valve gear cam and a second valve gear cam;
first and second rocker shafts arranged such that the camshaft is disposed between the first and second rocker shafts;
a first rocker arm swingably supported on the first rocker shaft and having a roller bearing at one end thereof, the roller bearing of the first rocker arm being arranged to contact with the first valve gear cam; and
a second rocker arm swingably supported on the second rocker shaft and having a roller bearing at one end thereof, the roller bearing of the second rocker arm being arranged to contact with the second valve gear cam; wherein
the first and second valve gear cams of the camshaft, respectively, include a base circle and a cam nose projecting from the base circle, and the first rocker arm and the first valve gear cam are arranged such that when the roller bearing of the first rocker arm contacts with the base circle of the first valve gear cam, the first rocker shaft is located closer to the camshaft than a location of a center of rotation of the roller bearing of the first rocker arm.

Claim 12 (previously presented): The valve gear according to claim 11, wherein
the first rocker shaft is arranged to support the first rocker arm and is positioned forwardly of a center line which passes through a center of the camshaft to extend axially of a cylinder in a direction of rotation of the camshaft, and the second rocker

shaft is arranged to support the second rocker arm and is positioned rearwardly of the center line in the direction of rotation of the camshaft.

Claim 13 (previously presented): The valve gear according to claim 12, wherein the roller bearing of the first rocker arm and the roller bearing of the second rocker arm, respectively, are offset relative to the center line of the cylinder in an axial direction of the camshaft, and the roller bearing of the first rocker arm offset farther from the center line than the roller bearing of the second rocker arm.

Claim 14 (previously presented): The valve gear according to claim 11, wherein the second rocker arm and the second valve gear cam are arranged such that when the roller bearing of the second rocker arm contacts with the base circle of the second valve gear cam, the second rocker shaft is located farther away from the camshaft than a center of rotation of the roller bearing of the second rocker arm.

Claim 15 (previously presented): The valve gear according to claim 11, wherein the first rocker arm opens and closes at least one exhaust valve and the second rocker arm opens and closes at least one intake valve.

Claim 16 (previously presented): The valve gear according to claim 11, wherein the first rocker arm and the first valve gear cam are arranged such that when the roller bearing of the first rocker arm contacts with the base circle of the first valve gear cam, a force exerted on a contact portion at which the cam nose and the roller bearing of the first rocker arm contact each other does not act along a line which connects a center of rotation of the roller bearing of the first rocker shaft and a center of the first rocker shaft.

Claim 17 (previously presented): The valve gear according to claim 11, wherein the first rocker arm and the first valve gear cam are arranged such that the first rocker

shaft is not moved in a direction in which the roller bearing of the first rocker arm is moved when the cam nose of the first valve gear cam contacts and pushes up the roller bearing of the first rocker shaft.

Claim 18 (previously presented): The valve gear according to claim 11, wherein the following relationship is satisfied: $\theta_1 > \theta_2$; wherein

θ_1 indicates an intersecting angle between a line which connects the center of the first rocker shaft and the center of rotation of the roller bearing of the first rocker arm, and a line which connects a center of rotation of the camshaft and the center of rotation of the roller bearing of the first rocker arm, and θ_2 indicates an intersecting angle between a line which connects a center of the second rocker shaft and a center of rotation of the roller bearing of the second rocker arm, and a line which connects the center of rotation of the camshaft and the center of rotation of the roller bearing of the second rocker arm.

Claim 19 (previously presented): The valve gear according to claim 18, wherein the intersecting angle θ_1 is larger than approximately 90 degrees and the intersecting angle θ_2 is smaller than approximately 90 degrees.

Claim 20 (previously presented): An engine comprising the valve gear according to claim 11.

Claim 21 (previously presented): An engine according to claim 20, wherein the engine is a four-cycle engine.

Claim 22 (previously presented): A vehicle comprising the engine according to claim 20.

Claim 23 (previously presented): A vehicle according to claim 22, wherein the vehicle is a motorcycle.

Claim 24 (previously presented): A valve gear comprising:
a camshaft having a first valve gear cam and a second valve gear cam;
first and second rocker shafts arranged such that the camshaft is disposed between the first and second rocker shafts;
a first rocker arm swingably supported on the first rocker shaft and having a roller bearing at one end thereof, the roller bearing of the first rocker arm being arranged to contact with the first valve gear cam; and
a second rocker arm swingably supported on the second rocker shaft and having a roller bearing at one end thereof, the roller bearing of the second rocker arm being arranged to contact with the second valve gear cam; wherein
the first and second valve gear cams of the camshaft, respectively, include a base circle and a cam nose projecting from the base circle, and the first rocker arm and the first valve gear cam are arranged such that a relationship between relative positions of a center of the first rocker shaft, a center of rotation of the roller bearing of the first rocker arm, and a center of rotation of the camshaft is such that the first rocker arm does not buckle when the cam nose of the first valve gear cam contacts with the roller bearing of the first rocker arm to cause the first rocker arm to swing in a valve opening direction.

Claim 25 (previously presented): The valve gear according to claim 24, wherein the first rocker shaft is arranged to support the first rocker arm and is positioned forwardly of a center line which passes through a center of the camshaft to extend axially of a cylinder in a direction of rotation of the camshaft, and the second rocker shaft is arranged to support the second rocker arm and is positioned rearwardly of the

center line in the direction of rotation of the camshaft.

Claim 26 (previously presented): The valve gear according to claim 25, wherein the roller bearing of the first rocker arm and the roller bearing of the second rocker arm, respectively, are offset relative to the center line of the cylinder in an axial direction of the camshaft, and the roller bearing of the first rocker arm offset farther from the center line than the roller bearing of the second rocker arm.

Claim 27 (previously presented): The valve gear according to claim 25, wherein the first rocker arm and the first valve gear cam are arranged such that when the roller bearing of the first rocker arm contacts with the base circle of the first valve gear cam, the first rocker shaft is located closer to the camshaft than a location of a center of rotation of the roller bearing of the first rocker arm

Claim 28 (previously presented): The valve gear according to claim 27, wherein the second rocker arm and the second valve gear cam are arranged such that when the roller bearing of the second rocker arm contacts with the base circle of the second valve gear cam, the second rocker shaft is located farther away from the camshaft than a center of rotation of the roller bearing of the second rocker arm.

Claim 29 (previously presented): The valve gear according to claim 25, wherein the first rocker arm opens and closes at least one exhaust valve and the second rocker arm opens and closes at least one intake valve.

Claim 30 (previously presented): The valve gear according to claim 25, wherein the first rocker arm and the first valve gear cam are arranged such that when the roller bearing of the first rocker arm contacts with the base circle of the first valve gear cam, a force exerted on a contact portion at which the cam nose and the roller bearing of the

first rocker arm contact each other does not act along a line which connects a center of rotation of the roller bearing of the first rocker shaft and a center of the first rocker shaft.

Claim 31 (previously presented): The valve gear according to claim 25, wherein the first rocker arm and the first valve gear cam are arranged such that the first rocker shaft is not moved in a direction in which the roller bearing of the first rocker arm is moved when the cam nose of the first valve gear cam contacts and pushes up the roller bearing of the first rocker shaft.

Claim 32 (previously presented): The valve gear according to claim 25, wherein the following relationship is satisfied: $\theta_1 > \theta_2$; wherein

θ_1 indicates an intersecting angle between a line which connects the center of the first rocker shaft and the center of rotation of the roller bearing of the first rocker arm, and a line which connects a center of rotation of the camshaft and the center of rotation of the roller bearing of the first rocker arm, and θ_2 indicates an intersecting angle between a line which connects a center of the second rocker shaft and a center of rotation of the roller bearing of the second rocker arm, and a line which connects the center of rotation of the camshaft and the center of rotation of the roller bearing of the second rocker arm.

Claim 33 (previously presented): The valve gear according to claim 32, wherein the intersecting angle θ_1 is larger than approximately 90 degrees and the intersecting angle θ_2 is smaller than approximately 90 degrees.

Claim 34 (previously presented): An engine comprising the valve gear according to claim 25.

Claim 35 (previously presented): An engine according to claim 34, wherein the engine is a four-cycle engine.

Claim 36 (previously presented): A vehicle comprising the engine according to claim 34.

Claim 37 (previously presented): A vehicle according to claim 36, wherein the vehicle is a motorcycle.

Claim 38 (previously presented): A valve gear comprising:
a camshaft having a first valve gear cam and a second valve gear cam;
first and second rocker shafts arranged such that the camshaft is disposed between the first and second rocker shafts;
a first rocker arm swingably supported on the first rocker shaft and having a roller bearing at one end thereof, the roller bearing of the first rocker arm being arranged to contact with the first valve gear cam; and
a second rocker arm swingably supported on the second rocker shaft and having a roller bearing at one end thereof, the roller bearing of the second rocker arm being arranged to contact with the second valve gear cam; wherein
the first and second valve gear cams of the camshaft, respectively, include a base circle and a cam nose projecting from the base circle, and the first rocker arm and the first valve gear cam are arranged such that when the roller bearing of the first rocker arm contacts with the base circle of the first valve gear cam, a force exerted on a contact portion at which the cam nose and the roller bearing of the first rocker arm contact each other does not act along a line which connects a center of rotation of the roller bearing of the first rocker shaft and a center of the first rocker shaft.

Claim 39 (previously presented): The valve gear according to claim 38, wherein the first rocker shaft is arranged to support the first rocker arm and is positioned forwardly of a center line which passes through a center of the camshaft to extend axially of a cylinder in a direction of rotation of the camshaft, and the second rocker shaft is arranged to support the second rocker arm and is positioned rearwardly of the center line in the direction of rotation of the camshaft.

Claim 40 (previously presented): The valve gear according to claim 39, wherein the roller bearing of the first rocker arm and the roller bearing of the second rocker arm, respectively, are offset relative to the center line of the cylinder in an axial direction of the camshaft, and the roller bearing of the first rocker arm offset farther from the center line than the roller bearing of the second rocker arm.

Claim 41 (previously presented): The valve gear according to claim 38, wherein the second rocker arm and the second valve gear cam are arranged such that when the roller bearing of the second rocker arm contacts with the base circle of the second valve gear cam, the second rocker shaft is located farther away from the camshaft than a center of rotation of the roller bearing of the second rocker arm.

Claim 42 (previously presented): The valve gear according to claim 38, wherein the first rocker arm opens and closes at least one exhaust valve and the second rocker arm opens and closes at least one intake valve.

Claim 43 (previously presented): The valve gear according to claim 38, wherein the first rocker arm and the first valve gear cam are arranged such that the first rocker shaft is not moved in a direction in which the roller bearing of the first rocker arm is moved when the cam nose of the first valve gear cam contacts and pushes up the roller bearing of the first rocker shaft.

Claim 44 (previously presented): The valve gear according to claim 38, wherein the following relationship is satisfied: $\theta_1 > \theta_2$; wherein

θ_1 indicates an intersecting angle between a line which connects the center of the first rocker shaft and the center of rotation of the roller bearing of the first rocker arm, and a line which connects a center of rotation of the camshaft and the center of rotation of the roller bearing of the first rocker arm, and θ_2 indicates an intersecting angle between a line which connects a center of the second rocker shaft and a center of rotation of the roller bearing of the second rocker arm, and a line which connects the center of rotation of the camshaft and the center of rotation of the roller bearing of the second rocker arm.

Claim 45 (previously presented): The valve gear according to claim 44, wherein the intersecting angle θ_1 is larger than approximately 90 degrees and the intersecting angle θ_2 is smaller than approximately 90 degrees.

Claim 46 (previously presented): An engine comprising the valve gear according to claim 38.

Claim 47 (previously presented): An engine according to claim 46, wherein the engine is a four-cycle engine.

Claim 48 (previously presented): A vehicle comprising the engine according to claim 46.

Claim 49 (previously presented): A vehicle according to claim 48, wherein the vehicle is a motorcycle.

Claim 50 (currently amended): A valve gear comprising:
a camshaft having a first valve gear cam and a second valve gear cam;
first and second rocker shafts arranged such that the camshaft is disposed between the first and second rocker shafts;
a first rocker arm swingably supported on the first rocker shaft and having a roller bearing at one end thereof, the roller bearing of the first rocker arm being arranged to contact with the first valve gear cam; and
a second rocker arm swingably supported on the second rocker shaft and having a roller bearing at one end thereof, the roller bearing of the second rocker arm being arranged to contact with the second valve gear cam; wherein
the first and second valve gear cams of the camshaft, respectively, include a base circle and a cam nose projecting from the base circle, and the first rocker arm and the first valve gear cam are arranged such that the first rocker shaft is not moved in a direction in which the roller bearing of the first rocker arm is moved when the cam nose of the first valve gear cam contacts and pushes up the roller bearing of the first rocker shaft;

$\theta 1$ indicates an intersecting angle between a line which connects the center of the first rocker shaft and the center of rotation of the roller bearing of the first rocker arm, and a line which connects a center of rotation of the camshaft and the center of rotation of the roller bearing of the first rocker arm; and

$\theta 1$ is larger than approximately 90 degrees.

Claim 51 (previously presented): The valve gear according to claim 50, wherein
the first rocker shaft is arranged to support the first rocker arm and is positioned forwardly of a center line which passes through a center of the camshaft to extend axially of a cylinder in a direction of rotation of the camshaft, and the second rocker shaft is arranged to support the second rocker arm and is positioned rearwardly of the

center line in the direction of rotation of the camshaft.

Claim 52 (previously presented): The valve gear according to claim 51, wherein the roller bearing of the first rocker arm and the roller bearing of the second rocker arm, respectively, are offset relative to the center line of the cylinder in an axial direction of the camshaft, and the roller bearing of the first rocker arm offset farther from the center line than the roller bearing of the second rocker arm.

Claim 53 (previously presented): The valve gear according to claim 50, wherein the second rocker arm and the second valve gear cam are arranged such that when the roller bearing of the second rocker arm contacts with the base circle of the second valve gear cam, the second rocker shaft is located farther away from the camshaft than a center of rotation of the roller bearing of the second rocker arm.

Claim 54 (previously presented): The valve gear according to claim 50, wherein the first rocker arm opens and closes at least one exhaust valve and the second rocker arm opens and closes at least one intake valve.

Claim 55 (currently amended): The valve gear according to claim 50, wherein the following relationship is satisfied: $\theta_1 > \theta_2$; wherein

θ_1 indicates an intersecting angle between a line which connects the center of the first rocker shaft and the center of rotation of the roller bearing of the first rocker arm, and a line which connects a center of rotation of the camshaft and the center of rotation of the roller bearing of the first rocker arm, and θ_2 indicates an intersecting angle between a line which connects a center of the second rocker shaft and a center of rotation of the roller bearing of the second rocker arm, and a line which connects the center of rotation of the camshaft and the center of rotation of the roller bearing of the second rocker arm.

Claim 56 (currently amended): The valve gear according to claim ~~50~~55, wherein the intersecting angle $\theta 1$ is larger than approximately 90 degrees and the intersecting angle $\theta 2$ is smaller than approximately 90 degrees.

Claim 57 (previously presented): An engine comprising the valve gear according to claim 50.

Claim 58 (previously presented): An engine according to claim 57, wherein the engine is a four-cycle engine.

Claim 59 (previously presented): A vehicle comprising the engine according to claim 57.

Claim 60 (previously presented): A vehicle according to claim 59, wherein the vehicle is a motorcycle.

Claim 61 (previously presented): A four-cycle engine comprising:
a cylinder having a bore center line;
a cylinder head connected to the cylinder and having an exhaust valve and an intake valve;
a camshaft supported by the cylinder head and having a first valve gear cam and a second valve gear cam;
first and second rocker shafts arranged such that the camshaft is disposed between the first and second rocker shafts;
a first rocker arm swingably supported on the first rocker shaft and having a roller bearing at one end thereof, the roller bearing of the first rocker arm being arranged to contact with the first valve gear cam, the first rocker arm acting to drive one of the

exhaust valve and the intake valve; and

a second rocker arm swingably supported on the second rocker shaft and having a roller bearing at one end thereof, the roller bearing of the second rocker arm being arranged to contact with the second valve gear cam, the second rocker arm acting to drive the other of the exhaust valve and the intake valve; wherein

the first and second valve gear cams of the camshaft, respectively, include a base circle and a cam nose projecting from the base circle, and the first rocker arm and the first valve gear cam are arranged such that when the roller bearing of the first rocker arm contacts with the base circle of the first valve gear cam, the first rocker shaft is located closer to the camshaft than a location of a center of rotation of the roller bearing of the first rocker arm.

Claim 62 (previously presented): The four-cycle engine according to claim 61, wherein the exhaust valve and the intake valve, respectively, include a valve stem at a first end thereof, and the first rocker arm and the second rocker arm, respectively, include another end to push the valve stem, and the cylinder head includes a first opening to expose abutting portions of the other end of the first rocker arm and the valve stem, and a second opening to expose abutting portions of the other end of the second rocker arm and the valve stem, the first opening and the second opening being arranged to be opposed to each other with the bore center line therebetween and covered by respective common removable covers, and the covers include first and second walls on inner surfaces thereof which are opposed to the abutting portions and arranged to receive a lubricating oil, the first wall being formed with supply ports through which the lubricating oil is applied to the abutting portions of the other end of the first rocker arm and the valve stem, and the second wall being formed with supply ports through which the lubricating oil is applied to the abutting portions of the other end of the second rocker arm and the valve stem.